ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Redevelopment of Spectrum To	)	**ET Docket No. 92-9**
Encourage Innovation in the	)	
Use of New Telecommunications	)	RM-7981
Technologies	)	RM-8004

To: The Commission
Attention: Mail Stop 1170

COMMENTS OF THE PUBLIC BROADCASTING SERVICE

1. The Public Broadcasting Service ("PBS") hereby submits these comments in response to the Commission's Further Notice of Proposed Rule Making ("FNPRM") in the above-captioned proceeding, FCC 92-357, released September 4, 1992.[1/] PBS is a nonprofit membership corporation, the members of which are the licensees of most of the nation's public television stations. PBS provides program distribution and other services to its members.

2. The FNPRM looks toward revising the technical rules governing common carrier and private point-to-point microwave systems to facilitate the accommodation of private systems now operating in the 2 GHz band which will be displaced when their frequencies are reallocated for Personal Communications Systems ("PCS"). PBS's concern is that the proposed common carrier digital channel loading requirements, discussed at Paragraph 31

[1/] The time for filing Comments was extended to December 11, 1992, in an Order, DA 92-1599, released November 24, 1992.

of the FNPRM and set forth in proposed Section 21.122(a)(2) of the Commission's Rules and Regulations, while perhaps appropriate for the voice channel systems for which they were developed, are inappropriate and burdensome for the digital links that will soon be needed to relay digitally encoded motion video material, such as compressed NTSC and Advanced Television System ("ATV") signals, to broadcasters, including links interconnected to satellite distribution systems.

3. PBS is a customer of Micronet, Inc. for common carrier point-to-point microwave service, used to connect the PBS Technical Operations Center ("TOC") in Alexandria, Virginia, with the PBS Satellite Operations Center ("SOC") in the Bren Mar area of Fairfax County, Virginia. Multiple channels of NTSC television and ancillary channels are relayed from the TOC to the SOC and in the reverse direction, over main and backup routes.[2/] The television signals are uplinked at the SOC to domestic communications satellites, via which the programs are distributed to public television stations in various time zones throughout the country. Thus the Micronet common carrier microwave system is an integral and critical part of the basic national distribution system for public television programming in the United States.

4. The Commission is currently embarked on an historic proceeding looking toward converting American television broadcasting from the analog NTSC standard to a new digital ATV standard to be selected in MM Docket No. 87-268. This impending change in television broadcast standards, together with new developments in video compression

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[2/] The main route operates in the 11 GHz band, with a longer haul backup route in the 6 GHz band. The call signs are WCT955, WCT957, WDU592, and KGB34.

technology generally, will require the conversion of supporting transmission systems, including the microwave link between the PBS TOC and SOC, to digital operation. PBS is actively involved in the development and evaluation of a digitally encoded motion video satellite delivery system to public television stations and has applied for and been granted experimental licenses to transmit digital signals between the TOC and SOC in connection with this work.

5. When television broadcasting becomes digital, if not before then, PBS's entire distribution system, including the TOC-SOC interconnection link, will have to be converted permanently to digital operation. At that time, the link will presumably become subject to Section 21.122(a)(2). However, the efficiency standards in that section, while perhaps appropriate for voice telephony channels,[3/] will present serious problems if applied to television program distribution systems, because they require the use of a digital modulation scheme which is inconsistent with the modulation scheme used by communications satellites that either take a signal from a microwave link or deliver a signal to it.

6. The proposed efficiency standard in Section 21.122(a)(2) requires the use of quadrature amplitude modulation ("QAM"). QAM, while highly efficient, requires highly linear amplifiers. However, highly linear amplifiers are not available on communications satellites, because they consume more power than is available in orbit. To be compatible with the non-linear amplifiers on satellites, earth stations will have to use quadrature phase shift keyed modulation ("QPSK") when uplinking television feeds.

[3/] The discussion in Paragraph 31 of the FNPRM refers twice to "voice channel loading standards."

7. The terrestrial microwave entrance link to the earth station should be modulated in the same way as the earth station uplink. If QAM were required for the terrestrial link and QPSK for the satellite uplink, traffic would have to be reprocessed at the uplink and remodulated before being transmitted to the satellite. That process could introduce additional errors and would add complexity to system control and new costs to the program distribution chain. PBS could alleviate these problems to some extent by moving its TOC to the uplink location, but such a move would be impractical and would involve additional personnel and unnecessary expense and effort to coordinate operations at PBS headquarters in Alexandria and the remote TOC. The proper, effective, and efficient way to operate the public television distribution system is to create the program distribution feed in final digital form at the TOC at PBS headquarters and to have the entire distribution system act as a transparent end-to-end pipeline all the way to the control rooms of individual public television stations.

8. PBS notes that the efficiency standards proposed for Section 21.122(a)(2) have not been proposed for Part 74 of the Rules, which governs the broadcast auxiliary service bands. These bands have been exempted from this proceeding because all of their capacity is needed for future digital television systems. The exemption is appropriate, given the problems discussed above. However, broadcasters cannot always rely on Part 74 and must sometimes order service from common carriers.[4/] If the proposed efficiency standard does

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[4/] That is the case with the PBS TOC-SOC interconnection link. When the PBS satellite distribution system was first built in the mid-1970's, PBS was unable to find Part 74 channels that could provide reliable, interference-free service of the sufficient quality to support a national television broadcast program distribution system.

not take broadcasters' needs into account, broadcasters will be deprived of service they need, common carriers will be deprived of video customers, and the operation of PBS's national program distribution service will be threatened just when the advent of digital television requires more service of higher quality.

9. Accordingly, PBS urges the Commission to provide an exception, perhaps by means of a footnote to Section 21.122(a)(2), stating that:

> Microwave systems carrying digital motion video material, such as television programming, may use modulation schemes consistent with the modulation of the systems into or from which their traffic is being fed, without regard to this sub-section, provided that they comply with the 1 bit/sec/Hz requirement in Section 21.122(a)(1).[5/]

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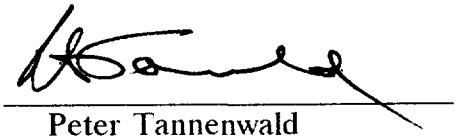
Respectfully submitted,



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[5/] The 1 bit/sec/Hz objective is attainable with QPSK modulation.

CERTIFICATE OF SERVICE

I, Diane Rook, do hereby certify that I have, this 11th day of December, 1992, caused to be delivered by hand a copy of the foregoing "Comments of the Public Broadcasting Service" to the following:

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Diane Rook

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